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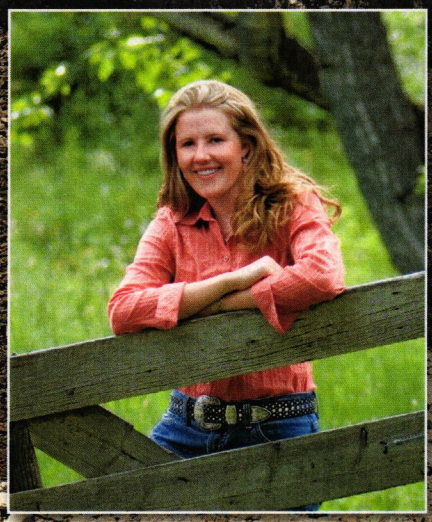

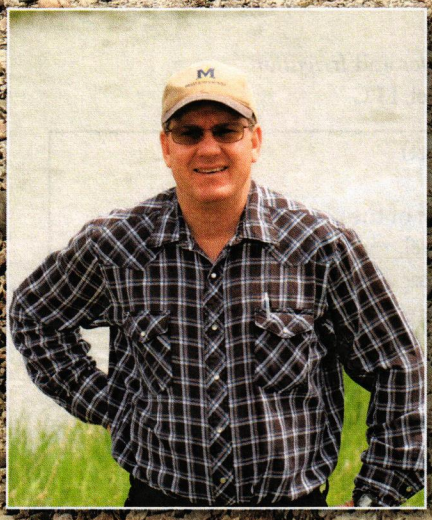

Catastrophic Failure on the Milk River Project

Catastrophe at the St. Mary Unit

By Kris Polly

On May 17, the long-feared happened—the catastrophic failure of drop structure 5 in the St. Mary unit of Montana's Milk River Project. Unless and until the St. Mary unit is repaired, it will not be possible to replenish the project's storage, threatening the agricultural producers and municipalities that rely on its water. Much of this July/August issue of *Irrigation Leader* is devoted to this critical situation and how to resolve it.

Our cover interview features Jennifer Patrick of the Milk River Joint Board of Control and Marko Manoukian of the St. Mary Rehabilitation Working Group, two individuals who are working on the ground to facilitate the drop 5 repair. We also speak to Shelby Hagenauer and Steve Davies of the Bureau of Reclamation about the agency's response to the drop structure failure and to Congressman Greg Gianforte and Senators Steve Daines and Jon Tester about how they are advocating for Montana in the U.S. Congress. Mike Murphy of the Montana Water Resources Association gives us a Montana-wide view of the needs and top issues of water users and suppliers. We also speak with Jeanne Whiteing, an attorney and member of the Blackfeet Nation, on whose reservation the drop 5 structure stands, about how the State of Montana, Reclamation, and other entities are cooperating with the tribe to repair the structure, and with Kristal Fox, the administrator of the Fort Belknap Indian Community's Water Resources Department, which relies in large part on water delivered by the Milk River Project.

We also speak with Raymond Bell of the Sidney Water Users Irrigation District and Doug Martin of the Kinsey Irrigation Company. These two eastern Montana irrigation districts are facing the prospect of losing access to the affordable Pick-Sloan Missouri Basin Program power that, for 75 years, has allowed them to provide water to dozens of local family farms. They are working hard in cooperation with the Montana congressional delegation to pass legislation that will allow them to continue to use it.

It is too easy to take our nation's irrigation infrastructure for granted. The underfunding of aging infrastructure repairs can lead, in worst-case scenarios, to catastrophic failures like the one that happened at the St. Mary unit. The value of such infrastructure becomes vividly clear when it is lost. The consequences of such a loss are significant. We must not wait until such failures occur to understand the indispensability of our irrigation infrastructure. IL

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Catastrophic Failure on the Milk River Project

An aerial photo of drop 5 after its collapse.

On May 17, a drop structure on the Milk River Project, which conveys water to the Milk River in Montana's Hi-Line Region, failed catastrophically. The supplemental flows to the Milk River that the project was founded to supply have ceased and will not resume until the structure is repaired. While local reservoirs hold adequate water for limited operations to continue this year, the drop structure failure presages shortages and rationing for local irrigators and municipalities.

In this interview, Jennifer Patrick, the program manager of the Milk River Joint Board of Control (MRJBOC), and Marko Manoukian, the Montana State University (MSU) extension agent in Phillips County and the local chairperson for the St. Mary Rehabilitation Working Group, tell Irrigation Leader *about this urgent problem and the prospects for reconstruction.*

Irrigation Leader: Please tell us about yourselves.

Jennifer Patrick: I am the program manager of the MRJBOC, which is made up of eight irrigation districts that serve a total of about 110,000 irrigated acres. The MRJBOC acts as a liaison between stakeholders, including the irrigators and federal, state, and tribal entities, all of whom share the goal of delivering water to the Milk River basin. I have been in my current position since April 2007.

Marko Manoukian: By day, I'm the MSU Phillips County extension agent. I am also the chairperson of the St. Mary Rehabilitation Working Group. The working group originated in 2003, when Lieutenant Governor Karl Ohs, who has since passed away, held a meeting in Havre to raise awareness of the fact that the State of Montana was providing money to a federal project. Ohs was from Malta, Montana, and understood the importance of the water to the Hi-Line region of Montana. At the meeting in Havre, he had all the interested parties involved, including Walleyes Unlimited, the tribes, and the irrigators. Based on that meeting, he created the St. Mary Rehabilitation Working Group. I was an inaugural member of the working group and have served as a representative for Phillips County since 2003. When our local chairperson, Randy Reed, passed away, the group asked me to assume his position. Additionally, Jenn and I have acted as the coordinators of the St. Mary Rehabilitation Working Group, providing information and guidance to its members, taking input from them, and moving forward with our goal of getting legislation passed to benefit the Milk River Project.

Irrigation Leader: Would you tell us about the history of the Milk River Project?

PHOTO COURTESY OF JENN PATRICK.

Jennifer Patrick: The majority of the construction of the Milk River Project was authorized in 1905 and lasted until Fresno Dam was completed in 1939. The plan was to transfer water from a basin that had abundant water to a basin where there was no water—namely, the Milk River basin. The Milk River has limited flows, so the Milk River Project brings water through a 29-mile canal with a series of siphons, checks, wasteways, and drops that discharges water into the north fork of the Milk River, which then travels 216 miles through Alberta, Canada, before reentering the United States and depositing the water in Fresno Reservoir near Havre.

Today, the Milk River Project irrigates about 140,000 acres. That includes the land irrigated by the eight irrigation districts, the Fort Belknap Indian Community, Bowdoin Wildlife Refuge, municipalities, and individual state and private pump contracts. There are also additional tribal authorized purposes identified in the 2017 Blackfeet Compact that are being established.

Irrigation Leader: Would you walk us through the timeline of events before the drop 5 failure on May 17?

Jennifer Patrick: About a week before the drop 5 failure, we noted another failure—there was water leaking behind a gate. It was pretty close to startup, so before it became a bigger issue, we shut down the canal; some overflows were coming through the current structures. On May 17 at about 3:00 p.m., we received a call that the drop structure had failed. In fact, only about half the water that would usually be running through the system was actually running at the time, so we were lucky—if it had been the normal amount of water, it would have taken out a lot more of the canal bank and surrounding area than it did.

This concrete drop structure is the last of five drop structures that use gravity and siphons to convey water through the canal. We probably will never know the cause of the failure of the drop, but it was over 100 years old, so I am sure that age played a large role.

The MRJBOC, the Bureau of Reclamation, and the State of Montana's Department of Natural Resources and Conservation (DNRC) conducted an engineering site inspection on May 27 to assess the damage and to determine whether an interim fix that would allow us to move water this year was feasible. The team concluded that the complexities and costs associated with an interim solution could not be justified, considering the anticipated costs and the minimal gains in water supply it would allow. Subsequently, the decision was made to immediately replace both drop 5 and drop 2, another high-risk drop structure, with the intent of completing construction by late this summer.

Irrigation Leader: How does the drop 5 failure affect downstream water users?

Jennifer Patrick: The storage for this year is pretty decent, but the failure means that the water we have now is all we can plan on having until the structures are repaired. Fresno and Nelson Reservoirs started the year full. That allows us to deliver one round of irrigation to all the contracted acres. The irrigation districts usually are able to deliver two full rounds of irrigation, using about an acre-foot per acre each time. The failure essentially took the second round of irrigation off the table. Without a couple timely precipitation events, the farmers will be looking at crop losses. Fresno Reservoir is fed primarily by this transfer—in a dry year, 95 percent of its water is transferred through the St. Mary system to the Milk River Project. It's a big deal for the Milk River basin on both sides of the U.S.-Canada border. A few of the municipalities east of Fresno are completely dependent on this water as well. If we don't fix the system this year, and fix it right, the storage we currently have in the basin will be depleted and we will have to rely on runoff and rain for irrigation. In that case, the cities and towns will face restrictions. The project also creates habitat for wildlife and provides water for recreational uses; we have not even begun to quantify those losses beyond this season.

Irrigation Leader: What are the next steps that need to be taken?

Jennifer Patrick: The MRJBOC has signed an agreement with Reclamation that temporarily transfers operations from Reclamation to the MRJBOC board and has hired a contractor. Within the next few weeks, after we secure landowner agreements and complete the permitting paperwork, the contractor will begin work on drop 5, and hopefully on drop 2 as well. We are trying to come up with the funding package for drop 2, which actually looked worse than drop 5 before the failure. This will allow us to replace the two structures at the same time. The project is also on the Blackfeet Indian Reservation, so we have cultural and environmental compliances that we are working through as well. The tribe has been helpful with the processes and helping us through the requirements despite the COVID-19 restrictions it is under.

Irrigation Leader: How long do you think the construction project will take, and what will the cost be?

Jennifer Patrick: We are looking at a 4-month construction season, although I still hope that we can move some water before it is over. If everything goes well, water will start being delivered again in September; that depends on the Montana weather.

Irrigation Leader: How would you characterize the cooperation between MRJBOC and Reclamation?

Jennifer Patrick: The Reclamation team has been excellent. Steve Davies of Reclamation's area office always has his hands full, but he has made this a priority and has extended all available resources to walk us through the processes. Right now, they are probably sick of me, but I have been talking to two of the engineers on the project, Chris Gomer and Steve Darlinton, on a daily basis as we jump through hoops and try to stay ahead of the contractors' arrival. We are also still trying to get through the irrigation season and to leave the right amount of water in storage facilities for municipal use. Clayton Jordan has been keeping up with the overwhelming change, trying to read his crystal ball, and trying to keep everyone happy.

Even though this is a federal project, other entities have stepped up, too. The director of the DNRC, John Tubbs, has been leading the efforts of the State of Montana and has been supportive. The cities, towns, and other entities that sit on the St. Mary Rehabilitation Working Group have all been supportive as well. They are always asking what they can do for us. As I said before, we are in Blackfeet country, and the Blackfeet Nation has been supporting and helping us. The tribe also has a stake in this: As the compact was settled in 2017, the tribe can develop its 5,000 acre-feet of water right now, but with the system down, it's pretty hard to deliver any water or establish new contracts. COVID-19 has not helped us at all there—many tribal offices are shut down, but everyone is doing their best to get to the table and work on the permitting and compliances. The International Joint Commission (IJC) and the National Resources Conservation Service have also stepped up and are trying to take part in the team and processes. That, to my mind, is positive.

Irrigation Leader: What is the anticipated overall cost of repairing drops 2 and 5?

Jennifer Patrick: Engineering estimates suggest that there has been a lot of damage; a lot of material has left the site. Until we get in there and get things going, it will be really hard to identify exact numbers.

Irrigation Leader: What is your message to Congress and your congressional delegation?

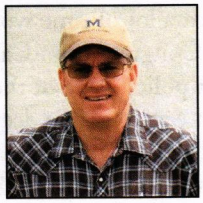
Jennifer Patrick: Help us come up with a reasonable cost-share agreement for the entire rehabilitation of the project. Our state, local, and federal legislators have been supportive and have helped to push Commissioner Burman of Reclamation to help us with financing. To the congressional delegation, I would say that the aging infrastructure of this project needs to be addressed. In addition to these two drop structures, there are issues with a diversion dam and other parts of the water transfer in this 29-mile canal and project. We have quite a few other structures in dire need of repairs. This failure is already causing a loss of water to the project. If another structure fails in a year or two, shutting down another system, the Milk River basin will not survive.

Marko Manoukian: A specific message for Congress is that Reclamation can only work within the laws that currently exist. All along, we've been asking for a cost allocation change. Roughly 75 percent of the project and maintenance costs need to be covered by the users; 25 percent is covered by the federal government. We'd like to invert those numbers. All the structures in this project are more than 104 years old. Just addressing one element is not going to be a solution. We need a long-term plan to address all these things, just like Goshen County did last year. It is in the same boat we are, with a tremendous amount of aging infrastructure.

Irrigation Leader: Is there anything else you would like to discuss?

Marko Manoukian: Water is a basic human need. Now that our system is compromised, not only are irrigators going to need to figure out how to maintain productivity, but local communities are going to be saddled with rationing water. Our friends to the north are going to be facing a real issue; they only have 3 months' worth of storage for Milk River Canada. They'll feel the effects even more, but even Chinook, the Fort Belknap Agency, Harlem, and Havre are going to see rationing as time goes on.

Jennifer Patrick: The situation has shone light on the fact that the town of Milk River, Alberta, has wells that supply water to the towns of Coutts, Alberta, and Sweet Grass, Montana. The town of Milk River has 3–4 months' worth of storage, but otherwise, they're 100 percent dependent on this system as well. They're having conversations on their response, interim solutions, and what this all means. Can Canada actually provide funding? As in the United States, the process is cumbersome and slow. Those conversations are happening at the IJC level. IL



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PHOTOS COURTESY OF JENN PATRICK AND MARKO MANOUKIAN.

The Bureau of Reclamation's Response to the Drop 5 Failure

The top portion of the collapsed drop 5 structure is excavated.

Excavators atop the collapsed drop 5 structure, seen from below.

Montana's Milk River Project is a Bureau of Reclamation project whose history goes back a century. After the recent catastrophic failure of one of the project's drop structures, Reclamation has been working closely with the Milk River Joint Board of Control (MRJBOC), the State of Montana, local Native American tribes, and other stakeholders to plan for a permanent repair to the structure.

In this interview, Shelby Hagenauer, Reclamation's deputy commissioner, and Steve Davies, the manager of Reclamation's Montana area office, tell Irrigation Leader *about the role the agency has played in the response to the drop structure failure and the plans for a permanent solution to the problem.*

Irrigation Leader: Please tell us about your backgrounds and your current roles.

Shelby Hagenauer: As a deputy commissioner at Reclamation, my responsibility is to be the alter ego of the commissioner. My focus is working with our stakeholders, with Congress, and with the public. I've been in this position since October 2018. I'm proud to be at Reclamation, representing President Trump, Secretary Bernhardt, and Commissioner Burman as we focus on our mission to provide reliable water and power to the West. As for my background, I've spent a lot of time working on Capitol Hill for members of Congress from California. That was my introduction to water policy. One of the reasons I wanted to come to Reclamation was to gain a deeper understanding of the breadth of the work that is done across the West to support communities, farms, and families. My father was a pilot in the Air Force, so I'm a military kid. Home is where your parents are right now, and they're in California. That's where I spent most of my time and effort professionally also.

Steve Davies: I'm the manager for Reclamation's Montana area office and have served in that capacity for 5 years. I currently have oversight responsibility for all Reclamation facilities in Montana east of the Continental Divide, which covers 13 projects serving about 400,000 acres of irrigated agriculture. There are lots of structures and lots of stakeholders, including irrigators, power customers, the State of Montana, private interests, and tribes.

Previously, I was the facility operations and maintenance division manager for the Montana area office. I've been in the Montana office for 25 years and with Reclamation for 35 years. I'm originally from South Dakota, and I started with Reclamation in South Dakota in the Black Hills and worked on the Buffalo Bill Dam project in Cody, Wyoming, for a number of years as well. I've really enjoyed working on hydropower and irrigation facilities.

Irrigation Leader: On May 17, the drop 5 structure in the St. Mary unit of Montana's Milk River Project failed. Please describe the actions Reclamation has taken to address the failure.

Steve Davies: Reclamation assembled a large technical team that included representatives from Reclamation, the MRJBOC, its engineering consultant HDR Engineering, the Montana Department of Natural Resources and Conservation, the Blackfeet Nation, and the tribe's engineering consultant. It took us a week to get on site for an assessment due to access and weather conditions, primarily rain. In addition, we had to immediately shut off the canal and wait for the area to drain. About a week later, a large team that included staff from our Denver and Billings offices and stakeholders assembled at the site to evaluate the situation and plan our approach. We gathered a lot of data on the topography of the area and took photos. After the site visit, we continued to discuss how to fix or replace drop 5 and what temporary repairs to put in place in the meantime. It was a quick, in-depth discussion about how to get the canal back online, how long it might take, what it might cost, and the water supply benefits it would provide. We evaluated how the temporary options and the permanent replacement of the structure might affect irrigation and water

PHOTOS COURTESY OF THE BUREAU OF RECLAMATION.

supply schedules, trying to provide as much information as possible to the MRJBOC. It is the organization most affected, as it has lost a significant part of its irrigation season. Over a period of 2–3 weeks culminating on June 4, we presented everything that we had determined to the MRJBOC. Based on that, the MRJBOC made the decision not to pursue temporary repairs, since they would take almost as long as a permanent replacement, would complicate the permanent replacement, could cost $1 million, and might gain only a week's worth of additional irrigation. The MRJBOC weighed a lot of risks before it elected to forgo temporary repairs and focus on the permanent repair. Because it is forgoing half its irrigation season, its irrigators, who normally get 2 acre-feet per acre per year, will only be getting 1. Fresno and Nelson Reservoirs are supplying water now, but unless there is more rain, the irrigation season will be over by about mid-July. We're ensuring that the municipalities have a water supply through the winter. Right now, the state, the MRJBOC, and Reclamation are focused on getting these repairs done now so that there is water next year.

Irrigation Leader: Would you tell us about the permanent repairs you are planning for drops 2 and 5?

Steve Davies: At the start of fiscal year 2020, the MRJBOC and Reclamation had planned on replacing drop structure 2. Drop 2 was fully designed and was ready to go out for solicitation. Both drops 2 and 5 were deemed to be at high risk of failure. Based on inspections we had done about 6 years ago, we focused primarily on drop 2. Lo and behold, drop 5 failed first. If there's anything positive about that, it is that the construction for drop 2 is fully designed; those plans are actually being used to help guide the design for the repair of drop 5. While our focus has obviously shifted to drop 5, we're all cognizant that the worst thing that could happen would be repairing drop 5, turning the canal back on, and then having drop 2 fail. That led to the MRJBOC's decision to pursue both repairs simultaneously.

Irrigation Leader: How would you describe the path forward?

Steve Davies: Reclamation's contractual relationship with the MRJBOC is highly positive. We were able to temporarily transfer operations and maintenance and replacement responsibilities to the MRJBOC for drops 2 and 5. This is a bit unique because normally Reclamation leads all maintenance activities on the St. Mary facilities. The MRJBOC, along with its consultant, is now capably leading the effort and has hired a contractor to work on the site. It began excavating drop 5 on June 22 and afterward, it will move to drop 2 and start forming concrete structures. The construction period is expected to last at least through August and likely into September. Depending on when it finishes, there may be an opportunity to move some water this year to shore up water supplies in the downstream reservoirs.

Irrigation Leader: What other stakeholders has Reclamation worked with?

Steve Davies: The State of Montana has bonding authority and is an important partner from a potential funding perspective. The canal and drop structures are located entirely within the Blackfeet Indian Reservation. We've had tremendous support and assistance on environmental and cultural issues from the Blackfeet Nation. We're appreciative of that. That collaboration is going to continue. Tribal staff, along with their environmental consultants, will be on site for the construction to make sure the contractor meets all tribal requirements. Another group that we collaborate with extensively is the International Joint Commission, which deals with the cross-border nature of the Milk River. The accrediting officers for the United States and Canada are meeting regularly on this. The Canadians are not used to seeing such a limited water supply in the Milk River in Canada. They don't have a right to the water that we move through Canada, but they are affected by the overall situation of low flow.

Shelby Hagenauer: The coordination that has been part of the response to the situation has illustrated Reclamation's intention to be a water user–focused agency. The work that the local office has done over the years to develop relationships with local communities, water users, and the tribes is what makes Reclamation's work successful. We've also made sure that we're communicating with the Montana congressional delegation. Congress is an important stakeholder and an important part of this process. We appreciate that we've got an open communication line with them; Steve has helped provide the congressional delegation updates to make sure that they know what is going on.

Irrigation Leader: How would you describe Reclamation's commitment to the stakeholders?

Shelby Hagenauer: We value our relationships with our stakeholder partners here and across the West. Reclamation and the customers of the Milk River Project have been working together closely for many years to understand the limitations of aging infrastructure and what needs to be done to remedy them. While none of us wanted this failure to happen, we were ready. When it happened, everyone jumped into action to work together. Reclamation is committed to seeing these facilities repaired and moving water as soon as possible

Irrigation Leader: Would you tell us about your cooperation with the tribes?

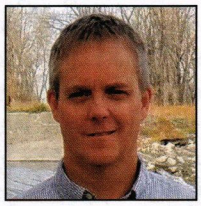
Steve Davies: It has been positive. We've had briefings with the Blackfeet Nation's Tribal Council on environmental and cultural matters. We are in near-daily contact with the staff

of the Blackfeet Nation. The tribe is going to have an onsite monitor. This project also has the potential to affect another tribal entity, the Fort Belknap Indian Irrigation Project (FBIIP), which is located below Havre and has water rights to natural flows and storage in Fresno Reservoir. We're working with FBIIP and making sure we're communicating any effects this work may have on its water supply. We aren't seeing any yet, but we are monitoring the situation closely.

Irrigation Leader: What should everyone who is dependent on a Reclamation project know about Reclamation?

Shelby Hagenauer: We are committed to our stakeholders. President Trump, Secretary Bernhardt, Commissioner Burman, and our whole team are committed to providing reliable water and power to families, farms, and communities across the American West. That covers a variety of things, from addressing issues like the collapse on the St. Mary Canal in the Milk River Project to looking at new opportunities for storage in areas that have challenges with droughts. Reclamation just celebrated its 118th birthday on June 17, and we and our stakeholders are facing the challenge of aging infrastructure. We are focused on dam safety and maintaining existing reserved and transferred works, but we are also looking forward to the needs of the future.

Steve Davies: We take our role seriously. The challenges that Reclamation and its stakeholders face with aging infrastructure cannot be overstated. There are many structures over 100 years old. Funding constraints on infrastructure projects across the United States are just as challenging as the technical task of designing replacements. IL



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